



Frederick County and the Towns of Middletown and Stephens City

Water Source Overview

Major water sources include groundwater wells and quarries.

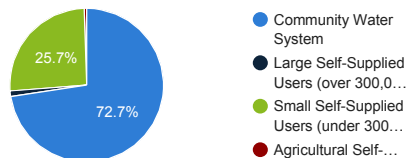
***Table 1:** Reported (2010) and projected (2040) water use by system type for Frederick County in MGD

| Type | Reported Use 2010 MGD | Projected Use 2040 MGD |
|---|-----------------------|------------------------|
| Community Water System | 6.642 | 20.897 |
| Large Self-Supplied Users (over 300,000 gal/month) | 0.104 | 0.104 |
| Small Self-Supplied Users (under 300,000 gal/month) | 2.347 | 2.347 |
| Agricultural Self-Supplied Users | 0.049 | 0.049 |

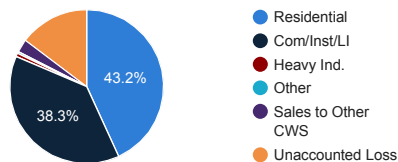
Water Use by System Type

Approximately 31,299 people use private groundwater wells for residential water supply. All tables and graphs represent reported water use including Sales to other localities, if applicable.

***Figure 1:** Percentage of reported water use by system type in 2010 (No use data shown on graph if less than .01 MGD: Refer to Table 1)



***Figure 2:** Disaggregated water use percentages for Community Water Systems in 2010 (No graph shown if no disaggregated use data reported)



***Table 2:** Reported (2010) and projected (2040) groundwater and surface water use for Frederick County in MGD

| Reported 2010 Groundwater Use (MGD) | Reported 2010 Surface Water Use (MGD) | Projected 2040 Groundwater Use (MGD) | Projected 2040 Surface Water Use (MGD) |
|-------------------------------------|---------------------------------------|--------------------------------------|--|
| 5.66 | 3.48 | 12.66 | 10.73 |

***Figure 3:** Frederick County highlighted in the Commonwealth of Virginia



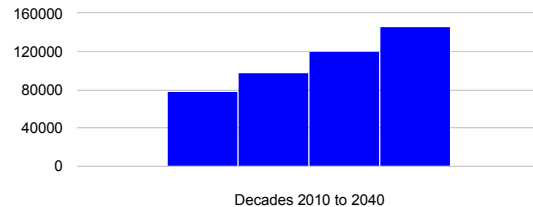
Projected Water Demand

Population and demand are projected to increase through the planning period. Frederick County Sanitation Authority (serving Frederick County and Stephens City) and the Town of Middletown acknowledge their demand will exceed their supply in the planning period. Frederick County Sanitation Authority alternatives include quarry expansion and groundwater well improvements. Middletown will implement conservation to stay within their purchase agreement limitations with Winchester.

***Table 3:** Frederick County population projections by decade from 2010 to 2040 (data gathered from VEC projections - 05/2013)

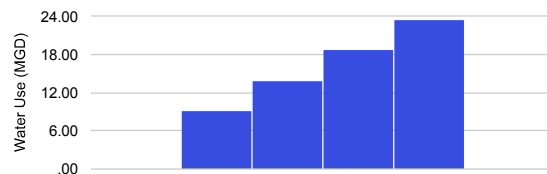
| 2010 | 2020 | 2030 | 2040 | % Change (2010-2040) |
|--------|--------|---------|---------|----------------------|
| 78,305 | 97,192 | 119,419 | 145,938 | 85.9% |

***Figure 4:** Frederick County population projections by decade for 2010, 2020, 2030 & 2040



***Table 4 & Figure 5:** Frederick County water demand trends by decade for 2010, 2020, 2030 & 2040 in MGD

| Reported Use 2010 MGD | Projected Use 2020 MGD | Projected Use 2030 MGD | Projected Use 2040 MGD | Percent Change (2010-2040) |
|-----------------------|------------------------|------------------------|------------------------|----------------------------|
| 9.14 | 13.89 | 18.65 | 23.40 | 155.9% |



Drought Management Practices

Frederick County and the Town of Stephens City each adopted an ordinance for the implementation and enforcement of the regional Drought Response and Contingency Plan (DRCP). The Town of Middletown is subject to the drought provisions established by the City of Winchester; the Town will issue an emergency ordinance to restrict water use and enforce the DRCP in accordance with the agreement with Winchester. (Northern Shenandoah Valley Regional WSP)